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ENVIRONMENT VERSUS HEREDITY

AROUND and within us there is ample evidence that the average human being fails to reach a really high level of development. But how much is inborn, and how much the mark of circumstance?

As a rule we cannot tell. It is possible to inherit genes that are lethal whatever the environment. And it is certain that an adverse environment may kill, however good the heredity. But between these two extremes our fate depends upon the life-long interplay of environment and innate potentialities.

Experiments have conclusively shown that changes in such environmental conditions as nutrition, temperature, light, moisture can completely alter the expression of genetic drives. The new circumstances interact with the hereditary trends to produce new characters. Return to the old environment, however, restores the original characters in the next generation. There has been no alteration in the hereditary germ plasm, but a mere temporary modification of its manifestations.

While heredity lays down the range of life, health, vigour, development possible to the individual, therefore, his environment decides what level he will reach within each range. Clearly, then, we can raise the level of human well-being and achievement if we can improve heredity, environment, or both.

As Dr. Eliot Slater suggests, see page 182, heredity could be improved in succeeding generations if, as our knowledge grew, we could steadily eliminate undesirable stocks and increase the chances of favourable genetic combinations by encouraging the well-endowed to mate with each other. Unfortunately we cannot at present say with certainty to what extent the average individual owes his superiority or inferiority to heredity or environment. We cannot even be certain that all our standards of superiority or inferiority are sound. We must be chary, therefore, of assuming a divine power of judgment.

There is, too, no acceptable evidence that by training an individual we can train the germ plasm that he will hand on to his descendants. Characteristics acquired during one's life-time are not handed on, except by example. And although the occurrence of mutations or sports can be increased by X-rays, hormones, chemicals, and sudden or extreme environmental changes, it would as yet be a bold, and indeed reckless, experimenter who would venture into the human field.

Environment, however, we can increasingly control. Admittedly incomplete though our knowledge is, we can, if we have the will, provide conditions and training that will help more and more of our people to attain their full hereditary possibilities. In doing so we might even contribute to the evolution of the human race by assuring the survival of desirable mutations that would have succumbed in a less kind environment.

It is man's mastery of his environment that is the mark of his biological ascendancy. It would be fitting if his planned use of that mastery to enrich the lives of all heightened also the evolutionary level that mankind can reach.

TOWARDS BETTER HEALTH

By Andrew Davidson, M.D., M.R.C.P.E., F.R.C.S.E., D.P.H., F.R.S.E., *Chief Medical Officer, Dept. of Health for Scotland*

Those whose duty it is to operate schemes for the betterment of the national health know that ignorance and apathy are two of the most stubborn enemies of progress. The only known method of combating their evil influence is by developing a national health consciousness through health education. This as a process must inevitably be slow and frequently disheartening, since as a rule it produces no dramatic results.

No matter what branch of the nation's health services comes under review or investigation, an invariable recommendation for improvement is that the public should be given more advice on health questions. The public appear to welcome such advice, but only if it is in simple and easily understandable terms. More education of expectant and nursing mothers in the care of their own and their infants' health is needed; more education in personal health in the schools is frequently emphasised: the importance of instruction in sex hygiene in schools and in youth organisations is constantly stressed: more information on food and food values is required: while the publicity in the national campaign for the prevention of infectious diseases, such as diphtheria and the common cold, is a new approach to the public through health education.

In extending these developments, however, the invaluable educational work carried out by health officers, sanitary inspectors, health visitors, school nurses, school teachers and others must be continued. Mass instruction by modern publicity methods should be supplementary to the personal touch of the trained social worker.

No really substantial and lasting improvement in the health of the country can be achieved without the active co-operation of the people and such co-operation does not come instinctively. While the first requirement is a community well-informed in health affairs, more is necessary to success. Each member of that community must practise the accepted principles of healthy living or disease prevention and must take advantage of the health services provided. There has been created for the care of the expectant mother and for the well-being of her infant, for instance, an elaborate range of services which should go far to promote healthy motherhood; but, while it is the case that ante-natal facilities are now much more freely used than they were ten years ago, there is room for a much wider use of these services. We in Scotland, for example, have lagged considerably behind England in

taking advantage of food supplements for the expectant mother. In such matters as these, hope of improvement rests in intensive health education.

The School Health Service not only has the distinction of having made the first preventive approach to the personal health of any section of the community, but has always offered facilities for health education at the most important and formative age. But even here, not enough has been made of the opportunities provided, and success has been limited.

Further, I doubt whether there is any general appreciation of the importance of the change from school life to that of industry. Here is a field of great opportunity for health education. Not only is there scope for educating employers in the importance of a good working environment and of suitable hours of work; equal scope exists for education of the workers in the use and value of health facilities provided at their work. Even in the selection of work there is a fruitful field for health education as many children drift into unsuitable occupations either because of lack of parental foresight or lack of guidance and advice from teachers and parents.

These examples serve to show the pressing need for the education of our people to a new attitude to health and to the health services.

Medical knowledge is progressing rapidly. Diseases which caused much suffering a generation ago can now be prevented while others can now be cured or kept under control. But advances in medical science will profit us little as a community unless they are harnessed to human needs, and they cannot be harnessed effectively without the co-operation of the individual citizen. It is of little service to know that immunisation is effective in the control of diphtheria unless parents can be induced to have their children immunised. Recent experience shows that this essential co-operation is not sufficiently received, although it is probable that apathy and not ignorance is responsible. There are other examples, however, where the individual *must* apply the discoveries of modern medical science or perish. Two examples are pernicious anaemia and diabetes; their sting has been removed by advances in methods of treatment. In such diseases, the co-operation of the patient is vital, for his condition will deteriorate if the control treatment is allowed to lapse.

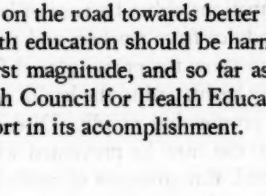
Health education then is necessary at all ages and perhaps not least for those who are no longer young. It has been said that by the age of 40 everyone should have profited by experience to the extent of knowing what he or she can or cannot do. But this is far from being true. There is, in fact, an enormous field of useful work for education in relation to the ageing process and the adaptation of man to advancing years. The proper balance of work and leisure, the development of hopes and aspirations, the gradation of physical effort—all these are important, but few of them ever receive the care they deserve.

As health education is of primary importance to the whole community

and to all ages, it is important that the media used in this form of education should be such as to reach the great mass of the community. This can never be done easily but health teaching is as worthy of serious thought as any other form of teaching and it requires all the aids that educationists and publicists can bring to its service. At the same time, it must always be supplementary to the educational work of existing health services, and although different methods may be practised, the lesson conveyed must be simple in terms and in presentation.

It cannot be too clearly emphasised that if attempts to promote interest in healthy living are to be widely successful, these must be furthered by every available means of approach and by every agency concerned with the welfare of the people. Whilst health authorities have a predominant part to play, the subject clearly involves the co-operation of others, particularly church and school.

If we are to progress on the road towards better health it is essential that all the resources of health education should be harnessed and co-ordinated. This is a task of the first magnitude, and so far as Scotland is concerned, the efforts of the Scottish Council for Health Education in this direction call for the maximum support in its accomplishment.



VILLAGE HALLS AND SOCIAL CENTRES

All who care for the communal life of the countryside will be pleased to hear of the agreement reached between the Ministry of Education, the Development Commission, the Carnegie (United Kingdom) Trust and the National Council of Social Service. Under this agreement the Carnegie trustees place at the disposal of the N.C.S.S. a sum of £100,000 to be expended during the next five years by way of grants in aid of capital expenditure on Village Halls, while the Treasury has approved the provision of further moneys by way of interest-free loans.

Grants and loans will be available to villages which themselves raise funds by voluntary effort, and the management of the Halls will thus remain in the hands of representative village committees. The N.C.S.S. publish a comprehensive illustrated booklet (3s. 9d., post free) entitled *Village Halls and Social Centres in the Countryside*, which sets out the conditions of this financial help and deals extensively with the siting, planning and building of Village Halls.

THE SEX PROBLEM—SOME SOCIAL AND PSYCHOLOGICAL FACTORS

By MARY MACAULAY, *Lecturer and Educationist*

IN time of war we can reasonably expect to find an increase in all social problems relating to sex. If we are wise we will be neither shocked nor dismayed by this, but will redouble our search for causes—and not neglect to look for them further back in the personal, family and social-psychological background. Sex is rooted in the whole question of our emotional life, and has a much wider significance and broader application than is usually admitted by those who regard it chiefly from its more specialised biological aspects.

Everything is born of Desire—not only our babies, but our ideas and inventions, all that we achieve or accomplish in our own development and work. There are countless ways by which we reproduce ourselves psychologically, materially and socially, urged on by our interest, enthusiasm, emotion or desire. It is the motive power behind our thinking, as well as behind all action and creation.

In this wider way our capacity to reproduce ourselves begins when we are born. And it gets a great deal of exercise and expression in either positive or negative ways in all the many activities and experiences of the personality during infancy and childhood. But we do not become heir to the full range of our potential reproductive power until puberty. From adolescence onwards the masculine and feminine aspects in the personality are more clearly defined and in more active operation; and the one-sexed body (male or female) becomes capable of using its biologically creative sex function. In general, there is little or no sane and sensible preparation for such an important event in our lives.

"Psychological Malnutrition"

It is commonly said that "Mental health depends upon emotional satisfactions." A well-satisfied (nourished) emotional life has that inner security and poise which is the surest safeguard against foolish, reckless, over-emotional or aggressive behaviour of any kind. The personality (the unseen inner psychological body of the child) is under much the same laws of health as the physical body. The establishment of Public Health has greatly improved the standard of physical care and nourishment for growing children. But there has been no corresponding rise in the standard of psychological care needed for the personality to keep it healthily growing-up.

And as yet there is little or no training or preparation for marriage and parenthood.

Therefore far too many young people arrive at the personally important and socially significant age of puberty (their full range of reproductive power) and come to their marriage in a state of psychological malnutrition. And they may also come to it burdened by serious personality conflicts or by various emotional congestions carried over from unsolved problems, in their infancy or childhood. In the main, these will have come from entirely preventable causes; more than likely from the well-intentioned efforts of parents who are ignorant of the nature and needs of children, or from teachers or others importantly concerned with their training or education as well as from the general social surroundings.

Many marriages fail in their purpose of harmony and growth for both partners, and in creating a happy home for children, because of a lack of the degree of psychological maturity needed for tackling the responsibilities of family life successfully. Men and women may also come to their marriage with too many materialistic or even sordid ideas, or with too many glamorously fairy-tale and foolishly idealistic ones.

There is seldom any practical preparation for the biological techniques and adjustments required in marriage, and even less preparation for the problems of psychological techniques and adjustments. As a result it is not uncommon for partners in marriage to be 'fond of each other' and yet to have a discouraging or even a devastating effect on each other's harmony and growth. If this is caused only by frictions—as it usually is—it can generally be worked out quite successfully (although it may need some outside advice and help); but if there are deep psychological and spiritual discords and conflicts this will be impossible. From the point of view of mental health no marriage is really valid that is annihilating the personality and character of one or of both the partners.

It might help to stem one of the chief sources of irresponsible personal behaviour and of some of the difficulties of personal adjustment to realise that we all have one simple life-purpose in common with each other—to grow. The urge to grow (to do, to dare, to know, to be) is innate in human nature, and is not limited to physical growth. It is very little understood and very seldom intelligently expressed—but there it is—and it must be reckoned with. Too many stringent and unnatural frustrations of this natural urge, or too many unintelligent and foolish indulgences of it, will result in inner insecurity and loss of personal dignity. The personality that is 'inferior' or the one that is bumptious and arrogant are equally unhealthy, and will be engaged, consciously or unconsciously, in 'getting their own back.' A loss of personal dignity (self-respect) is one of the basic causes of much confused and disordered conduct.

Need for Self-expression and Service

It is not perhaps usual to put forward one of the most pressing social questions of our time as a possible therapeutic measure for the relief of emotional congestions and therefore as a method of treatment for some of the social problems relating to sex. But here it is—are we or are we not prepared to let everyone, regardless of the circumstances of birth or social position, grow into the greatest possible expression of themselves according to their own gifts and talents?

Even if many of us are willing to reply to this question in the affirmative (and there will be many who are not willing to do so) there will be great difficulties in putting it into operation. The materialised civilisation in which we live, and the effect of modern conditions (even without a war) has laid a heavy emotional burden on us all, especially on young people. The sources of our stimulations are not few and steady (if limited) like those of our forefathers, who drew their inspiration mainly from religion, books, folk-lore, or from wandering minstrels travelling about on foot or on horseback. We are all under a continuous bombardment of new influences—swift, changing, often highly sensationalised stimulants from a great variety of *outside* sources, made possible in an age of material and scientific expansion. Our emotions are constantly being played upon and are in danger of becoming unreasonably enflamed, or of being dulled into stupid indifference through sheer exhaustion.

The modern age is full of commercialised entertainment and of vicarious thrills of many kinds, but it fails to provide reasonable and rightful opportunities for self-expression and for service for the average person. Modern conditions deny us many useful emotional outlets by a dearth of satisfying craftsmanship. Industry allows too little release to the emotional forces in our nature by its lack of any real social motive, its cold objectivity, and sometimes by a ruthlessly impersonal atmosphere which separates work from life.

Industry is not alone in this attitude of isolationism. It applies also to education, organised religion, and to other aspects of our *whole* life, kept in separate boxes and compartments by out-worn customs and traditional thinking. The needs of the emotional life are thwarted also by the soul-destroying monotony of mass-production when it is unrelieved by any sense of usefulness or of personal intelligence or initiative.

Cultural opportunities for emotional expression have been greatly curtailed by the disproportionate exaltation of science and intellectualism, which has discouraged the arts and almost disqualified religion as an important source of inspiration in our lives.

In youth we all crave for variety, change, action and fulfilment, and so detest all that is static or dull (dead). We are also inclined to see ourselves glamorously, and to want to make an impression upon those about us and

upon the world. A war may come as a release for many young people, a way of escape from the 'boxes and compartments,' the monotony or the 'nothingness' of their lives. And for some of them war will bring an emotional liberation, with its new experiences and new uses for their talents in interesting ways. It often supplies satisfying emotional experiences by means of comradeship and fellowship (one of the most deeply satisfying of all possible experiences in our lives).

Wartime Complications

But for a great many people war means the curtailment of many of the ways by which they would ordinarily be using up their emotional energies—in family life, their chosen work, social life, hobbies or crafts, and in various recreational, educational and cultural activities. A war imposes upon them a real black-out, a time of grim endurance, segregation, discomfort, boredom and loneliness. Their emotional energies and normal desires are thrown back into themselves with far too little means of outlet. Personal and social behaviour problems are sure to increase under these conditions.

In wartime, many young people inadequately prepared psychologically for such experiences must face hardships, risks, horrors and the sudden devastating loss of persons dear to them. They are also called upon to do on behalf of their nation and their 'cause' what they would never do on their own behalf, and what may be in direct violation to their own nature and temperament. They may be involved in situations where, reasonably or unreasonably, they feel some sense of deep regret or awful guilt—believing that if they had only done this, or that, 'it might have been different.' In gallantly trying to meet these experiences by themselves (for our deepest emotions are always very personal to ourselves, and it is often difficult or impossible to communicate them to anyone) they suffer an enormous increase of psychological stress and strain. This will cause strange moods of dark depression, unnatural gaiety, wild recklessness or apparent indifference. And these may result in foolish, or even in seriously anti-social behaviour of various kinds.

Adolescent young people, especially young girls (although this is true to some extent of all psychologically immature people of any age), are particularly receptive to mass suggestion, mass moods and attitudes, and these have certain fatalistic patterns in wartime (e.g. "What's the use?"—"He may never come back," etc.). These young people feel the rhythm of the psychological tides and cross-currents of their own generation. They are apt to pick up a strange assortment of ideas, and to get them mixed up in a queer twisted kind of way with their own idealism. Some of the really startling instances of reckless behaviour that we hear about on the part of young girls, sometimes girls of good family background, fall into this category. Serious as it is, it is never as bad as it looks.

There is an inexorable law of Balance (cause and effect) which decrees that too little or too much of any one thing must even itself up with too much or too little of its exact opposite. The psychological tides of past generations were filled with too much prudery, hypocrisy, snobbery, etc. It may well be that some of these difficult young people, who give us so much trouble, and whose behaviour we so deplore, are unconsciously evening up this old score. Psychological adolescence usually extends to 30 or 33 years. If they can reach this age without having been shattered by their recklessness many of them will develop into splendid people. This will more likely be true if we stand by them with our faith and our intelligence.

Rightly understood, sex may be said to be the law of growth. In this sense it is importantly related to the whole problem of reconstruction. It is at the very core of the challenge of the New Age.

BIOGRAPHICAL NOTES

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THE PROPER USE OF LEISURE

By R. G. Gordon, M.D., D.Sc., F.R.C.P. Ed., *Medical Director, Child Guidance Council*

Much is heard in these days on the subject of recreation and the proper use of leisure. It is perhaps necessary to clarify our ideas on the fundamentals of this subject.

C. K. Ogden was one of the first to point out that "games are not play"—a statement which seems sufficiently startling to a number of people unless they are quite clear as to the definition of the two terms. Let us attempt such definitions.

Play and Games

Play is the spontaneous activity of an animal—human or subhuman—whereby he exercises his muscles, sharpens his intelligence and enlarges his experience. There are no rules for such play except those which are improvised by the individual himself; and, while group play is possible, the purest form of play is that indulged in alone, for once a second person is introduced spontaneity is apt to be lost.

Games are a form of relaxation in which the activity is more or less stereotyped, being governed by rules imposed from without. While most games are played by larger or smaller groups, individual games are possible according to our definition, provided that rules and procedure are followed. For example, a solitary round of golf is as much a game as a cricket match since in both the player is bound by certain rules and conventions.

Animals and very young human beings indulge exclusively in play though true play goes on or should go on through life. Older human beings indulge in both play and games, and both are equally necessary for full education and recreation. There would be some who would describe the collective play of some animals as games, since this does seem to have a stereotyped form and so is apparently governed by rules, but we need not concern ourselves here with such a controversial subject.

The first play of the human baby is the waving of arms and kicking of legs, which obviously gives him such pleasure. Since it is spontaneous, play must always give pleasure because, if it failed to do so, it would not be indulged in. This does not mean that the results of play may not be painful, as when the implements of play are hot or sharp, but such experience sooner or later will prohibit just that sort of play. Games, on the other hand, are supposed to be pleasurable but are by no means always so, as many a shrinking youngster forced to plunge into the baths or join in a game of football would admit, if he had the courage to tell the unvarnished truth.

The Maturing of the Play Instinct

To return to the play of the baby, mere exuberance of muscular action soon gives place to more organised activities whereby he explores the nature, first of his own body and later of objects and persons round about him.

Play may be analytical or constructive, though constructive play comes later. The first tendency is to pull the watch to pieces to see how the wheels go round; only later is there any effort to assemble materials wherewith to make something new.

At first, play is muscular. That is to say, it consists of doing things, destructive or constructive. Later, however, play may be purely imaginative; and this is the best play of all, for it leads to much that is original in art and perhaps in science too. The day-dreams of the child, the phantasies which he weaves of what he would like to be or to have, are true spontaneous play and lead to the highest flights of poetry and art, and to the imaginative theories of the scientist. This will, of course, happen only if the individual possesses sufficient intellectual and emotional capacity to develop along constructive lines, and provided that the conventions and stresses of so-called real life do not stifle the spontaneity of such mental activities, as they too often do.

With advance in age, however, play tends to organise itself into games, since the average child is a communal animal and dislikes too much solitary activity. Communal play would be mere hooliganism if it were not restrained by rules and, indeed, collective hooliganism does occur and is always antisocial and therefore undesirable. Furthermore, the growing child likes rules and takes delight in organised activities quite apart from those of the secret societies and gangs of children of primary school age. It is a mistake to think that the average child likes to be completely free from restraint and rules. As a whole the juvenile republic schools have not been a success unless run by a head teacher of such remarkable personality that his very presence and influence result in a subtle and invisible organisation which may be even more potent than stereotyped rules.

Though childish play may develop into organised games, the distinction between the two should never be forgotten and leisure should not be so filled by such games so as to stifle spontaneous play. There was a time when such stifling was far too characteristic of the boarding school moulded on the tradition of the older public school. Recently, however, there has been a conscious or unconscious recognition of the evils of such a regime, and the boys and girls of today are undoubtedly given more opportunity to choose the way in which they will fill their periods of leisure, and to indulge themselves in spontaneous play.

Games have a great educative value however, and this should never be lost sight of. Games and play should be complementary and not mutually exclusive. Games train the child in discipline, cooperation and *esprit de corps*,

but are not enough in themselves. Although it may be true that Waterloo was won on the playing fields of Eton, modern warfare demands, in addition to these qualities, that individual initiative which is in no small degree the characteristic of play.

If this is true in war, how much more is it true in peace. The military game requires much more organisation, more rules and the incorporation of the individual in the crowd; but the logical development of such tendencies in peace is the Nazi-German mentality with its deadly seriousness and absence of humour and fun.

The Organisation of Leisure

Games are apt to be too serious and play too irresponsible, but a moderate and happy combination of the two should be the human being's birthright. This should be kept in mind by those whose task, whether official or self-imposed, is to regulate the leisure of the worker. Children and adults alike require both play and games, but it is easier to organise games than to make allowances for spontaneous play. Leisure alone and leisure in groups are both salutary and desirable and some will prefer one and some the other. Unfortunately, it is an all too common failing (especially of those in authority) to expect all others to like the things they like, and to do the things they do, and so the youth leader may attempt to coerce his charges to want what he thinks is good for them. Since most leaders are extraverts and extraverts like games, they are apt to wish to impose games on all their followers, whether they like them or not. The individual should be free, however, to use his leisure as he desires. The introvert, who, on the whole, likes to enjoy himself alone, should be free to do so without earning the disapproval or even the contempt of his extravert brothers. Unfortunately, if the individual, whether extravert or introvert, does not despise the characteristics of his opposite he may yearn after them, although he can never achieve them. So he is not content to follow his own bent but tortures himself because, on the one hand, he does not like games or, on the other, cannot enjoy spontaneous and imaginative play.

If people would only understand their own natures and have the courage to give rein to their own real tendencies, their lives would be much more pleasant, and they could enjoy their leisure much more than they do, to their own advantage and that of the community at large.

In future there will probably be more leisure for all and if it is used wisely and freely we may look forward to a happier, more contented and more efficient race. We must remember, however, that, although it may be well to organise leisure, within the organisation there must be ample scope and opportunity for all tastes and all tendencies.

VOCATIONAL GUIDANCE

By John Munro Fraser, M.A.,
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The problem of vocational guidance, when approached from the point of view of the individual pupil about to leave school, is essentially simple. It falls into three phases.

The first of these is an assessment of the pupil which takes into consideration his aptitudes, temperament and capacities, his education and background, his interests and his attitude towards work. As a result of this assessment a decision should be made on the broad types of employment for which he, as a whole person, is suited. It is important that all aspects of the pupil's personality and background should be taken into account, for it is possible, though perhaps unlikely, that a member of a professional or literary family might possess the aptitudes and capacity which would best fit him to be a bus-driver. To decide on that account to make him a bus-driver would be most unwise because it would leave out of account his education, interests and upbringing, and would probably place him in a most uncongenial working environment.

The second phase involves a knowledge of the jobs which fall under the broad types of employment decided upon and which might be available to the pupil on leaving school. This must not be confined to a simple listing of, say, factory jobs for potential factory workers, but must comprehend a familiarity with the social and physical environment in which each job will be carried on, a knowledge of the rewards (both financial in the shape of wages and intangible in the shape of a sense of achievement or social approval) which they offer, and an appreciation of the prospects of future advancement which they hold. This second phase of the process of guidance will culminate in a decision that the young person will apply to a specific type of firm or institution for a particular kind of job.

The third phase is one of pure administration and aims at putting the pupil in touch with the people who have suitable jobs to offer, and of ensuring that he receives due consideration from them.

The Square Peg—

We are thus confronted with two decisions, one based on an assessment of the pupil and concerned with the broad types of employment for which he is suited, the other based on knowledge of available employment and concerned with the specific job for which he should apply. Once these two decisions have been made the remainder is straightforward administration. It is to be noted, however, that the rightness of the decisions

arrived at will be affected by the adequacy of the administrative background, because it is unlikely that a system which cannot put candidates in touch with suitable employers will be able to make good decisions about what jobs they should apply for.

This type of vocational guidance for the individual is probably provided automatically in any educational institution where the teaching staff have really adequate knowledge of their pupils and are in touch with prospective employers, and where the parents are in the educational and vocational picture. In our older universities, for example, liaison between tutor, parent and student probably results in most cases in an excellent decision on the general type of employment which is most suitable, while the information gained from a wide circle of influential acquaintances may well result in an equally good decision to enter a particular calling. Where personal relationships are of this standard the question of administration does not arise.

Only a minority, however, can aspire to such educational and social advantages and few institutions are so well placed in regard to all-round knowledge of their pupils and possible avenues of employment. For the majority, vocational guidance must be approached from a different angle, one where the element of administration bulks larger. This is the social approach to vocational guidance and it presents a more complex picture. Basically it is a problem of two social groupings, one educational and the second economic, and of the yearly passage of an age group from one to the other. Neither the educational grouping nor the economic is homogeneous and of those who pass from one to the other the majority may be fifteen years old, but many will be two, three, or even six years older.

Young people come from all kinds of schools and places of learning. Some of these provide specialised education or training, but most do not; some are linked up traditionally or geographically with certain places of employment, but the majority are not. The general impression is of young people pouring out of the many exits from the educational groupings of the country, passing through a transition period where their paths diverge and cross until they disappear into the various entrances to the economic groupings. It is a scene not unlike the emptying of a number of cinemas, theatres and restaurants and the re-grouping of their human contents in trains, buses and undergrounds. The transition we are concerned with is not carried out in the blackout which has shrouded such movements in recent years, but it is doubtful whether the pupil leaving school has such a clear idea of where he wants to go as the home-returning reveller.

To achieve this transition with the minimum of human and economic waste it is necessary that the three phases described above should be effectively carried out. Various bodies exist to perform these functions, but before they are described it is advisable to consider in greater detail what

is involved. The first decision, that of the general type of employment to be followed, has two aspects—one an evaluation of the young person's aptitudes, temperament, capacities, training, background and interests; the other a knowledge of what is required by various types of employment. Some progress has been made in both these directions. Aptitude and capacity can now be measured by psychological tests properly applied and if these are supplemented by the advice of an informed and interested teacher a high degree of accuracy in evaluation may be reached. The teacher again can assess educational attainments and may give valuable information on temperament, background and interests, though here the cooperation of parents is perhaps essential. On the other hand, some information has been assembled about what various types of employment demand in intelligence, temperament, aptitude or training, but this is largely scattered in separate publications and reports and may not be readily available as a coherent whole. Before this first decision can be made, therefore, it is necessary that several different types of knowledge be collected, and in most cases it is probable that several different people must be called together.

The second decision, that of the actual job to be applied for, demands still more specialised knowledge. This concerns the range of possible employers, the type of jobs they have to offer both now and in the future, the probable trend of local industry and commerce and its effects on the prospects in each type of job. Such knowledge can only be within the scope of someone in very close touch with local economic life, and it is probable that only a specialist can deal adequately with it. Still another person, therefore, must be brought in before this second decision can be made.

Administration and Mental Attitude

It will be seen from the foregoing how important a part good administration plays in this approach to vocational guidance. So many facts have to be assembled and people brought together before decisions can be made, that definite channels of communication must be laid down and centres for the interchange of information provided. Perhaps even more important than the actual administrative machinery, however, is the attitude of mind on the part of those concerned. A perfect machine is useless until it is put into operation, and, if the operators are unaware of its potentialities, it will work ineffectively, or dangerously, or both. It is essential, then, that all those concerned with the transition from the educational grouping to the economic grouping should be aware of the problem in all its aspects and of the means available for its solution. And here a very special responsibility rests on the teacher. He (or she) is obviously in a key position in regard to the first decision to be made, for he is in possession of much of the information on which it is based and is well placed to acquire and interpret most of the remainder. In many ways, also, this decision as to the general type of employment is

the determinative one, and if the teacher fails to play his part in guiding it in the right direction the pupil may be sent forward to an entirely unsuitable way of life, with very unfortunate individual and social consequences.

The bodies formally responsible for the administration of vocational guidance in this country are in some areas the Juvenile Employment Exchange of the Ministry of Labour, and in others the Juvenile Employment Bureaux of the Local Education Authority. This division makes it impossible to generalise on the methods adopted throughout the country because, not only does the effectiveness of the administration vary from place to place as might be expected, but also the actual form is different. In most cases, however, a local committee is appointed, under the auspices of the Ministry of Labour or Local Education Authority. The personnel of this is drawn from local teachers, men and women with a sense of responsibility for local affairs and Ministry of Labour officials, including the Juvenile Employment Officer. A great deal depends on these committees. Their normal method of working is through a vocational guidance conference of pupil, parent, educational representative and Employment Officer.

In certain schools Careers Masters have been appointed. These may be specialists with a psychological training and a wide acquaintance with the practice of vocational guidance, or they may be normal members of the teaching staff who from aptitude or interest have undertaken this added responsibility. The National Institute of Industrial Psychology offers a consultative service through which young people can be psychologically tested and interviewed by trained personnel. On the basis of this a detailed report is given and a recommendation made as to the most suitable type of employment.

It will be seen, therefore, that the vocational guidance service in this country has a long way to go before we can be sure that every pupil leaving school has been placed in the job best suited to him. In accordance with our healthy traditions, the rate of progress will be determined in each locality by the awareness of the importance of the problem among those members of the community most intimately concerned. It is to be hoped that this awareness will develop rapidly, because a badly guided transition from school to industry has unfortunate social consequences. These may be considered from two sides—one which concerns the efficiency of industry as a whole, the other which concerns the well-being of the young entrant as an individual.

Industrial Waste and Personal Frustration

To deal briefly with the former point, it is now generally known how wasteful a high labour turnover can be. If a young worker leaves only a few weeks after engagement he represents almost a dead loss to his firm, because the amount of productive work he has done has not begun to offset

the wages he has been paid while learning, the time of a skilled worker taken off his own duties to train him, the spoilt work during his training period, the loss of machine time while he is producing below the standard rate and similar items. In wartime we are familiar with the idea that it takes time and money to train a bomber pilot, but we do not always realise that the same thing is true of every entrant into industry, and if new employees move from one job to another before they have passed out of the unproductive phase they represent a serious diversion of time, labour and plant from their proper functions. In the immediate post-war period, when the most pressing need of British industry will be to raise *per capita* production rates, it is to be hoped that this source of waste will be reduced to a minimum.

But in actual human values the second point is perhaps the more important. The child leaving school and entering industry is passing through an important stage of experience which calls for fundamental readjustments to his immediate associates, to those in charge of him at work and to his parents. He has ceased to be a passenger in our economic life and has stepped into a place, however small, as a contributor. In his little life this moment ranks with the first day at school, or even with marriage and parenthood, as a transition from a limited sphere into one where the potentialities for fulfilment or frustration are much greater. If this translation to a larger environment is badly handled, the consequences may be serious for the young person, and if he makes a failure of his first job then his introduction to this new world will have been unfortunate. Instead of taking a place alongside older brothers in a job, he may fall out of employment. Instead of earning a wage and contributing to the household expenses, he becomes once more economically dependent, and instead of fulfilling all the day-dreams and ambitions of the last years of school, he has been a failure where so many others have succeeded. That is a heavy weight of shame and disappointment to carry in adolescence, and it tends to hinder the chances of success in a second job. In fact, in many cases, a bad introduction to the first job has turned a young worker into a drifter from job to job until he is unfitted for regular responsible employment. It is important, then, that the young entrant should have the best possible chances of making a success of his first job so that the flavour of achievement and approbation can permeate all the difficulties of adjustment to factory hours and discipline, to different relationships with superiors and to a changed status in the home.

It must not be forgotten that vocational guidance concerns individuals first and jobs second. It is important, therefore, that the pupil's interests and ambitions should be given due weight and that those concerned with him should avoid the danger of looking on him as mere raw material for their administrative machinery. The element of guidance must always be emphasised and the difference between vocational guidance and industrial recruitment kept clearly in mind. Guidance does not involve regimentation

and the final decision should always rest, in the last resort, with the pupil. It is to be hoped that developments in technique and in public awareness of the problem will, in the course of the next few years, provide better opportunities for such decisions to be based on knowledge rather than ignorance, on responsible planning rather than caprice, and on a background of awareness of the social and individual implications on the part of all those concerned with the education of youth.

SUMMER SCHOOLS IN HEALTH EDUCATION

The Central Council for Health Education has recently concluded two summer schools in health education. One was a ten days' residential school held, amidst very pleasant surroundings, at Kingsmoor School, Glossop; the other, a fortnight's non-residential school, took place at Chelsea Polytechnic, London.

Both schools had programmes covering very much the same ground. Their purpose was to present a broad concept of health education, its possibilities, principles, and methods. The standard of the lectures and discussions was high; and it was generally agreed that the schools were of real value to those who attended.

One of the most valuable features of the schools was the opportunities they gave for doctors, educationists and nurses to meet each other and discuss their problems and their aims. This was particularly noticeable at the residential school at Glossop, where in addition there were very pleasant social activities. There was much ground to be covered, from heredity, through physiology, psychology, and epidemiology, to the methods of health education; and the students were kept busy, but happily busy.

Encouraged by the success of these schools, the Central Council has already arranged to hold a fortnight's summer school at Somerville College, Oxford, in 1946, from August 14th to 28th inclusive. The school will be residential, and accommodation will be available for a hundred students. The lines on which the school will be run will be broadly similar to those of the 1945 schools, but with improvements based on the experience at Glossop and Chelsea.

A very successful summer school was held at St. Andrews University from August 18th to September 1st, 1945. The Scottish Council for Health Education, who organised this school, are to be congratulated on the unquestioned success of their first venture into this field.

HEALTH EDUCATION IN GENERAL PRACTICE

By G. C. Milner *M.A., M.B., B.Chir.(Cantab.), M.R.C.S., L.R.C.P., Private Practitioner, and on Staff of Cray Valley Hospital*

The General Practitioner is probably more conscious of the need for the health education of the public than anyone else. It is scarcely necessary to read of the millions of pounds spent on patent medicines or the number of work hours lost to convince one how urgent is the need to try to achieve this end. There has seldom been a time when people were more health conscious or more anxious to do the right thing for themselves and their children, but there are many difficulties. Education implies the need of knowledge on the one hand and the capability to impart it on the other and, though the public recognises the technical training of the doctor, they are inclined to resent any suggestion that they may be lacking in what may be termed 'common sense,' and it is this unwillingness which engenders the age-long desire of the patient to follow special methods rather than simple ones.

Pride and Prescriptions

This desire goes back thousands of years, as in the story of Naaman (II Kings, Chap. 5) who, when the physician sent simple instructions by his secretary, went into a tower of rage and openly said that it was not what he had expected and that he had looked forward to some unusual dramatic gesture which would cure him of his ills. Human nature has changed little since those days, and now innumerable patients come to the doctor desiring him to put new life into them by injections, rather than by themeslves learning how to keep well. The picture stories that advertised a remedy for the ills alleged to be due to night starvation were at one time well known to the public eye. The reason for their success was that they appeared to portray what so many people felt, for it is, alas, only too true that at least 75 per cent of the population feel that they are lacking in the full zest for life which they understand should be theirs, and it needs little persuasion for them to accept the trial of 'taking something' in the false belief that it will rid them of their ills. It is easier for their mental pride to have a course of injections, a bottle of medicine, some vitamin preparation, or a course of ultra-violet light, and then hope that by means of these they will acquire the well-being for which they seek, than to alter their way of living. The former implies that, through no fault of their own, they lack something needful, whereas the latter suggests some failure on their part. The former they can bear, but the latter hurts their pride.

Unfortunately it is equally easy to prescribe a bottle of medicine and, for the majority of ills with which the General Practitioner is asked to deal, he has received no instruction during his medical training. Medical students are taught how to cure gastric and duodenal ulcers, but not how to get the patient with insufficient teeth or useless roots to bring himself to make the nccessary appointments for the unpleasant dental chair. Probably more than half the ills of those who go to the surgery are due not so much to any organic disease as to a failure to adapt their lives to the circumstances in which they have to live. Many an illness is acquired to enlist sympathy or divert attention from difficulties in the home and, when a patient comes to a crowded surgery with many more to follow, asking for a tonic, it is obviously much simpler to write a prescription than to enquire into the circumstances of his living which have reduced him to the state in which he now is.

This dissembling in thought is unfortunately encouraged by the inaccuracies even of common medical parlance. Thousands of certificates are printed stating that a patient is unable to work, and doctors continually sign these often untrue statements. What they really mean is that the patient is unfit to work. Careless and inaccurate speech and writing betray careless thought, and from this the best cannot be produced. Another common habit of doctors is to tell the patients that they want to see them again in so many days. This assists the belief of the patient that it is the doctor who is curing him and is responsible for his health, whereas what should be the truth is that the patient is recovering under the guidance and advice of the doctor who should tell the patient that he would do well to see him again in so many days for a review of his state and further guidance.

The Doctor's Responsibility

If any marked improvement is to be attained, some fundamental changes need to be made in the doctor-patient relationship. Unfortunately the fact that the suggested attitude of the doctor might diminish the attendances at the surgery and so lessen his income, and that it is difficult to get higher fees commensurate with the length of time taken to persuade a patient to alter his ways of living when a change would be distasteful to him, deter the doctor from following the more enlightened but more difficult course. Patients succumb to the desire to sit up late rather than seek an early bed and to their bibulous extravagances which, by depressing the higher centres, relieve them from dwelling on the difficulties they are unable to face and so postpone much needed action. It requires courage and faith that in the end a long term policy will be worth while, to tell the patient what he needs rather than what he wishes to hear, for if he is not satisfied he will go to another doctor who will give him what he desires.

Doctors are partly responsible for the common attitude of the patient.

The public believe that the doctor will not tell them what is wrong with them and some never ask, and so are perpetuated the old habits of the witch doctor and the medicine man. Sometimes, of course, the doctor does not tell because he does not know and then it may appear to be of great financial benefit to pretend to a secret omniscience and that it would not do to enlighten the patient. It needs a brave doctor to tell the patient that he does not know the cause of his complaint, and a trusting appreciative patient to continue with him after. That in the end truth pays is seldom better illustrated than with children who, after learning that they will not be hurt without first being told, will submit to all forms of investigation and treatment and even accept with resignation the painful ones which they know are unavoidable. They appreciate being treated as intelligent human beings and are sometimes grateful for the example set to their less intelligent parents.

A parent comes with a pale-faced round-shouldered child and says that he is always tired in spite of doing exercises every morning. He is subject to frequent colds, is constipated though he is always having medicine, and he is highly strung. He wants the doctor to give him a tonic. What he should be told is that he needs an adequate diet, with sufficient protein and less carbohydrates (difficult of fulfilment in war-time) and enough iron-containing green vegetables. The commonest cause of round shoulders is clothes that are too tight across the chest, and on undoing most growing boys' waistcoat buttons, putting their shoulders back and asking them to take a big breath, the majority of buttons will be inches from the button hole, and the answer to the parent who says that it is not normal for him to stand like that, is that his clothes don't give him the chance or opportunity but are condemning him to a bent spine and restricted chest. He should have longer hours in bed. "But he won't go to bed before 10 o'clock, doctor, though I am always telling him he should," says the parent, apparently happy in the belief that there his responsibility has ended. Further, it is not only useless, but positively harmful, to attempt exercises for already over-tired muscles. The child's nose is blocked and he is breathing through his mouth, and the suggestion that he should blow his nose and keep it clear is met by the reply, "I am always telling him to blow his nose, and he does, but it fills up as fast as he blows it." That this is an inaccurate statement and that the truth is that it is seldom, if ever, completely cleared throws further reflection on the parent and is seldom well received.

Constipation is nearly always mainly due to a failure to respond to even the slightest desire for defecation and the most important factor in overcoming it is to make sufficient effort to see that there is not only an immediate response to this desire but a definite allotment of time, usually after breakfast, for the person to go to stool and sit there if necessary for at least five minutes to give a chance for the impulse, which may have become latent,

to make itself felt. Another common factor is that there is insufficient intake of the drink that makes the lions strong—water. If a child is highly strung, it is due either to hereditary or environmental causes, for both of which the parent is responsible. It is a truism to say that the only real difficulty over children is the difficulty with their parents, but it is unfortunately with the parents that doctors have to deal.

Parental Responsibility

It is wearying telling these fundamental truths to patient after patient and few can bear without resentment the seeming reproof that they bring. It is one of the advantages of a public lecture that each hearer has the mental refuge of deluding himself that any reflection there may be is meant for the other stupid hearers and not for himself. Yet some of the seeds sown may grow, and the hearer may pass on useful suggestions with pride, as if they had themselves conceived the notion. The majority of folk enjoy advising others, whether they be competent or not; for the giving of advice suggests that they may be more knowledgeable than their fellows. The education of the public in these respects by short official films in the general programme would materially decrease the repetitive work that the doctor now finds takes so long. One unfortunate result of the public health services such as the clinics and the school medical service is that they tend to remove from the mind of the parent the attitude of personal responsibility for their own child's health, and no wide achievement can result unless there is established the fact that the primary person responsible for health is each individual or parent.

HEALTH EDUCATION OF PARENTS

An interesting development of the work of the Central Council for Health Education is courses of health education for parents. These are generally held through parent-teacher associations or as part of the activities of a maternity and child welfare centre.

Dealing with the simple mental and physical needs of the child, they seem to meet a real need. For example, a three lecture course, recently carried out by the Central Council on behalf of Dr. E. Caryl Thomas, Medical Officer of Health of Harrow, attracted an audience of about 130 parents to each lecture, at an average inclusive cost of 4d. per person per lecture.

A striking feature of these courses is the keen discussion which follows the lectures. Parents are clearly delighted to have an opportunity of posing their problems, and do so encouragingly freely.

DIPHTHERIA IN SCOTLAND

By Sir Alexander Russell, C.B.E., M.A., M.D., Ch.B., LL.D., D.P.H., D.T.M., I.M.S., *Deputy Chief Medical Officer, Department of Health for Scotland*

Diphtheria is a disease which has always taken a heavy toll of child life in Scotland and which has periodically appeared in epidemic form. After a number of what might be termed "normal" years, another epidemic wave commenced in early 1940 and during that year and the winter of 1940–41 caused a large number of deaths. This epidemic was by no means confined to the large towns but was evident almost throughout the whole country.

For some years prior to 1940 some medical officers of health had been trying to encourage the immunisation of children in their areas against diphtheria but these pioneer efforts, whilst they were of considerable value locally, exercised little influence on the widespread outbreak of the disease which mounted to its peak during December 1940 and January 1941.

About the end of 1940 it was decided to initiate a national campaign against diphtheria. Whilst it was realised that this was too late to have much effect on the epidemic then in existence, it was felt that the time had come to give the susceptible population groups the protection known to be conferred by the injection of a toxoid and that the general community was willing to accept this preventive action.

The immunisation campaign has now been waged in Scotland for four years, a sufficient period perhaps from which to judge possible results.

During these four years over 850,000 children between the ages of 1 to 15 years have been "immunised," though by far the greatest proportion was inoculated during 1941. At the present moment over 700,000 children (or 56 per cent) in these age groups are immunised and about 540,000 (or 44 per cent) remain unprotected. This is only fairly satisfactory and is really not good enough.

Every year between 80,000 and 90,000 Scottish children reach the age of one year when they ought to be protected from diphtheria. During 1943 and 1944 only some 20–25 per cent of the pre-school population group were actually immunised and in some areas as few as 10 per cent of the one year olds were protected. As it is generally held that about 75–80 per cent of a child population should be immunised if epidemics of diphtheria are to be avoided, it is obvious that danger lies ahead unless greater efforts are made. Meantime, the stimulus provided by the presence of an epidemic has faded out and public interest has switched to other matters. The very

success attained by the immunisation campaign is, in fact, the main reason for present indifference. When a diphtheria death has not been heard of in a county or a burgh for many months it is a little difficult for even the most enthusiastic health officer to persuade the mothers of young children to have their infants protected against what, to the average person, is a non-existent danger. But a few figures will, it is hoped, show that the danger is by no means past and that, indeed, an immunisation campaign must be carried on, without any remission, if the country is to be freed from a dangerous and deadly infection.

Take a glance at the following table which sets out the number of deaths in Scotland by quarters during the past five years.

TABLE I

Deaths from Diphtheria

	1939	*1940*	*1941*	*1942*	*1943*	*1944*
1st Quarter ..	110	155	187	115	75	64
2nd Quarter ..	79	127	117	57	51	45
3rd Quarter ..	77	160	88	49	35	28
4th Quarter ..	129	233	125	69	70	46
	395	675	517	290	231	183

The epidemic of 1940–41 evidently killed large numbers of young children and, what is not so evident, it caused a vast amount of unnecessary suffering and expense all over the country.

The figures also show that during the spring of 1942 a great change took place, the mortality from diphtheria in that quarter falling to a remarkable extent. For the past three years that decrease has continued, so that the total deaths during 1944 were less than half those recorded in 1939, which might, for comparative purposes, be called a "normal" year. (In passing, it may be added that a further and still more remarkable decrease has taken place during the first half of 1945, although complete figures are not yet available).

Now it might be held that the fall in mortality since early 1942 was due to the usual post-epidemic downward trend, so commonly seen in epidemiological graphs. No doubt, Scotland finds itself at present in an inter-epidemic phase as regards diphtheria but that is only a partial explanation. We can see from past figures that never before in Scottish records has diphtheria mortality been anything like so low as at present, and the only additional factor to be taken into account is that of the immunisation of over 56 per cent of the existing child population. Does it not seem reasonable, therefore, to ascribe the reduction in diphtheria deaths in great measure to this factor?

Another set of figures, however, goes to support the claim that the immunisation campaign has been successful in saving hundreds of children

from an early grave. Let us look at the next table which sets out, for the four years 1941 to 1944, all the diphtheria deaths into two groups, viz. (*a*) immunised and (*b*) non-immunised.

TABLE II

Deaths from Diphtheria (in children 1–15 years old)

	Immunised	*Non-Immunised*	*Grand Total*
1941	2	463	465
1942	11	242	253
1943	10	185	195
1944	4	159	163
Total	27	1,049	1,076

In the first place it must be stated that no medical scientist has ever claimed that immunisation confers 100 per cent protection. A small percentage of children is difficult to immunise; in an additional small percentage the protection fades away quickly. No doubt most of the 27 immunised children who died of diphtheria would be found in one or other of these two groups. It might be more accurate to use the word "inoculation" instead of "immunisation," except that it is so obvious that the vast majority of those who are "inoculated" with the appropriate toxoid become really "immunised."

In any case the figures in Table II, even as they stand, indicate without a shadow of doubt that the "immunised" child enjoys a high degree of protection from death from diphtheria. The phrase "even as they stand" is used in order to remind ourselves that the numbers of immunised children are considerably higher than those of the non-immunised, so that on an exactly proportional basis the difference between the two columns would be even more striking than is actually apparent. It is, therefore, fair to infer that the four years anti-diphtheria campaign in Scotland has not only saved the lives of several hundred children, but has also decreased markedly the great volume of sickness, suffering and disability always associated with this disease. From the purely cash point of view, the money invested in this campaign has already paid high dividends, a feature not always so easily demonstrable in public health balance sheets.

One must conclude with a note of warning. As has already been stated, only a small percentage of the pre-school child population is at present being immunised. The danger is that within a few years the percentage of immunised children under fifteen years of age will have fallen so low that the diphtheria bacillus will once more find a population unable to resist its attack and that another epidemic will sweep a devastating path over the whole country. That danger must be, if possible, avoided and it can be

avoided only if every member of the health services, every general practitioner, every teacher and every parent takes the necessary steps to have the children under his charge properly immunised at the proper time. Diphtheria is a disease which can be eliminated from a community inspired with the desire to practise preventive methods. The campaign against the disease in the past four years has shown what can be done even under the stress and strain of war conditions. The fact, however, that during 1944 there were still 163 child deaths from diphtheria in Scotland shows how much more remains to be done. During the past five-and-a-half years this country has been fighting for freedom—four different freedoms, in fact. But these do not include the shameful freedom which permits a parent to allow his child to die of diphtheria when that tragedy can be so largely avoided by taking a little thought and exercising a little care.

Let us glance for a moment at the 1944 diphtheria statistics in New York City. With a population of over 7½ millions, that city recorded last year a total of 242 cases with only 7 deaths. It should not be impossible for Scotland to emulate that all-time record, but we have, as is obvious, still a long, long way to go!

A BIRTHDAY CARD

One of the most effective means of getting the one-year-olds immunised is to send them the Central Council for Health Education birthday card on their first birthday.

A clerk can be made responsible for addressing envelopes from the registrar's return of births each week and filing them under the appropriate date a year ahead after putting a birthday card in each. The same clerk must also scan the weekly return of deaths regularly and destroy the envelope addressed to a child who has died.

In this simple way almost 100 per cent of the one-year-olds can be reached at the proper time.

When the record cards come in from the diphtheria immunisation clinic after completion of treatment, the names can be ticked off on the weekly return of births sheets; and, after a reasonable interval has elapsed, the names of the remainder can be given to the appropriate health visitor for a follow-up home visit.

PENICILLIN

By N. G. Heatley, M.A., Ph.D.
Research Biochemist

Six years ago the word penicillin was unknown to all but a few hundred scientists, and to most of them it was little more than a biological curiosity. Now scarcely a week passes without reference to it in some part of the popular press.

The First Observation

The story begins seventeen years ago in the bacteriological laboratory of St. Mary's Hospital, Paddington, where Professor Alexander Fleming was examining a pile of culture plates. He noticed that one of them, on which staphylococci had been growing, had become accidentally contaminated with a blue-green mould of the *Penicillium* group. Such contamination of plates by moulds or bacteria is not a rare happening, but in this case Professor Fleming's interest was aroused by the apparent dissolution of the germ colonies near the mould. Clearly the latter was putting out into the jelly on which it was growing some substance harmful to the bacteria. Following up this observation he found that, when the isolated mould was subcultured onto a variety of solid and liquid media, they gradually became golden yellow and at the same time acquired the property of preventing the growth of certain bacteria, sometimes even when diluted as much as one part in eight hundred. Not all bacteria were affected by this new antiseptic, as Fleming then considered it. In general, those associated with pus formation were sensitive, whilst others, such as the germs of cholera and typhoid, were quite insensitive. Other experiments were performed with the crude liquid, which, because it was derived from a mould of the genus *Penicillium* (*Penicillium notatum*) Fleming called "penicillin." This broth was found to be no more toxic than ordinary broth when injected into rabbits, and local application led Fleming to state three years later that it "... certainly appeared to be superior to dressings containing potent chemicals."

This antagonism of one microbe towards another was by no means a new observation. As early as 1877 Louis Pasteur, the great French chemist and biologist, had reported an example and had even written "This phenomenon would seem to offer the greatest possibilities from the therapeutic point of view." A product derived from another antagonistic bacterium was actually marketed by a German firm for several years, but had a somewhat doubtful therapeutic effect. Many other examples of antagonism between microbes have been reported and many have been suggested as suitable for use in medicine, but the example described by Fleming has since turned out to be by far the most important so far observed.

Fleming's first results were reported in 1929 and soon afterwards other London workers took up the problem, chiefly from a chemical point of view. Some further information was obtained, but the antibacterial substance was found to be difficult to work with as it was rather unstable. The problem was not pursued, for at that time there was little evidence to show that penicillin would turn out to be the astounding drug it has since proved. Moreover, attention was being diverted to the sulphonamide drugs, which showed the hitherto unheard-of property of killing germs in the body without at the same time injuring the patient. (Hundreds of disinfectants were known which would kill bacteria with ease, but they could not be used to fight infection in the body as they were more harmful to the body cells than to the invading germs.)

The Second Step

No fresh work on penicillin was published until 1940, when a paper entitled "Penicillin as a Chemotherapeutic Agent" was contributed to *The Lancet* from the Sir William Dunn School of Pathology, Oxford. The head of this department, Professor H. W. Florey, had for many years been interested in naturally occurring antibacterial substances, and in the middle 1930's he and Dr. E. Chain planned a long-term programme of research on these agents. (Such naturally occurring substances which prevent the growth of, kill, or dissolve bacteria are known as "antibiotics.") Of the many which had been reported, two were selected for a start, one of which was Fleming's penicillin. Chance has seemingly played a large part in the development of this valuable drug. Fleming's original observation sprang from the accidental contamination of a bacteriological plate by a mould, which by a long chance turned out to be one of the very few strains of the mould which produce penicillin in recognisable amount. By another stroke of fortune, Florey and Chain happened to choose this mould early in their studies, for of the other antibiotics then known, none has so far proved of comparable value.

Serious work began at Oxford in the late summer of 1939, and a team was gradually built up. Space does not permit mention of the various difficulties which arose, nor of the actual methods by which the mould was grown and the culture fluid extracted and purified; but at last, from what then seemed large amounts of fluid, a minute amount of golden yellow powder was obtained. With this powder it was possible for the first time to conduct careful pharmacological tests. The observations with crude culture fluid made by the earlier workers were confirmed and extended by tests on the powder, which was found capable of preventing the growth of staphylococci in the astonishing dilution of one part in more than a million of solution. This high potency suggested that the powder must be nearly pure, but it was afterwards found that less than 2 per cent of it was

pure penicillin, the remaining 98 per cent being inactive impurity. In spite of its great power against certain pathogenic bacteria, large amounts of this partially purified preparation could be injected into the bloodstream of mice without harmful effect. Penicillin thus resembled the sulphonamide drugs, except that it was far more potent antibiotically and far less toxic to the patient than they. It had other important advantages. Unlike the sulphonamides, its efficacy was not greatly influenced by the number of bacteria to be dealt with, nor was its inhibitory effect on the germs diminished by the presence of serum, pus or tissue breakdown products. These and other properties suggested that penicillin might be a valuable therapeutic agent, and this was quickly proved to be the case in mouse protection experiments. (A number of mice were injected with a large dose of lethal germs. Half the mice received penicillin. Those which did not receive it died; those which did, showed no ill effect.)

The next step was to show that penicillin was effective in human diseases, but as the yield from the mould culture fluid was extremely small, the problem was to obtain enough of the material. It was hoped that commercial firms would take over the large-scale growth of the mould, but it became clear that in view of their heavy commitments many months would pass before this could be done. The Oxford workers therefore made preparations to grow and extract the mould on as large a scale as possible in their own laboratory, and within less than six months of this decision being taken, enough of the partially pure drug had been prepared to treat a few dangerously ill human patients who had failed to respond to all other treatment, including the sulphonamide drugs. The response to penicillin was dramatic.

How Penicillin Works

Little is known of the way in which penicillin acts. It was for some time considered to be mainly a bacteriostatic, i.e. that it prevented bacteria from multiplying, rather than actually killing them, the leucocytes (the body's natural scavengers) then easily dealing with the invading germs. However, it has been shown outside the body that whilst germs which are in a resting state are not killed, young actively growing bacteria are killed very readily by penicillin. What takes place inside the body can at present only be guessed, but as the leucocytes and other body defences appear to be unharmed, even by very large doses of the drug, they can play their full part in bringing about recovery.

America Enters the Scene

The new therapeutic agent showed every promise of being particularly valuable in treating the infections associated with war wounds. Florey realised that the acute shortage of manpower and materials—this was in the

spring of 1941—would prevent British manufacturers from making the drug on anything like the scale required if this new weapon against infection were to be used during the war. So, in the summer of 1941, at the invitation of the Rockefeller Foundation, he visited America and enlisted the help of the scientists and drug manufacturers there. Had it not been for this far-sighted action of Florey's, which has passed practically without comment, there would certainly not have been sufficient penicillin to treat the casualties from the second front. In humanitarian terms this meant the saving of hundreds of lives and limbs which otherwise would have been lost; in strategic terms it meant that the time of healing of wounds was speeded up, sometimes to a fraction of the time which would have been required in the last war, and the return to active duty of cases which would formerly have been permanently disabled. It must be emphasised that good surgical technique is still the most important single factor in successful treatment; without it, penicillin cannot do its work, though penicillin in its turn enables the surgeon to proceed in comparative safety along lines which without it would be fraught with grave risks.

After Florey's visit in 1941, the American scientists rapidly became interested in penicillin and contributed many valuable observations on its properties and its formation by the mould, while their chemical engineers tackled the problem of large-scale production with characteristic energy and on a characteristically large scale. (By the end of 1943 the United States had spent over £5,000,000 on plant and equipment alone.) Although England has lagged behind America in large-scale production, much fundamental and applied research has continued to be done here. It is gratifying that throughout there has been the closest co-operation between workers in the British Empire and in the U.S.A.

Where there's a will—

The gradual development of penicillin, from a biological curiosity to an industry employing thousands of people directly and many more indirectly, provides a fascinating example of what can be done under present technological conditions when the will to press on is there. More and more different branches of human activity have become involved. On the manufacturing side special processes such as low temperature and high vacuum technique and attainment and maintenance of the highest degree of sterility, have been developed. On the research side there are literally hundreds of highly trained workers making applied and fundamental investigations into every imaginable aspect of the formation, production, use and structure of the substance. On the administrative side, the allocation and distribution of raw materials, plant and personnel have had to be worked out and the requirements of other industries taken into account and adjusted. Apart from the organisation and integration which is needed at all stages up to

and including the international level, many financial and political questions have also to be dealt with.

In conclusion, it can be stated that penicillin is now freely available to any ill person in this country who might be expected to benefit from it, although, until the supply becomes more plentiful, the Government has wisely decided that it shall be distributed only through certain selected centres.

BIOGRAPHICAL NOTES

MARY MACAULAY comes of a well-known Nova Scotian family. V.A.D. in 1914–1918 France, Malta, Salonica. Studied Sociology, did family case work, child study and parent education, Asst. Director Clinical Research Bureau, New York (Marriage Guidance). Lectured for Home and School Council Great Britain. She has now started an Educational Centre called the Iona Club in London.

R. G. GORDON, M.D., D.Sc., F.R.C.P. (Ed.).—Medical Director, Child Guidance Council; Physician, Royal United Hospital and Children's Orthopaedic Hospital, Bath; Member of the Medical Advisory Board, Institute of Medical Psychology, London; Consultant Neurologist, Stoke Park Colony; Author of *The Neurotic Personality*, etc.

N. G. HEATLEY, M.A., Ph.D., has carried out research in various branches of biochemistry, first under Sir F. Gowland Hopkins and Dr. Joseph Needham at Cambridge, then under Sir Howard Florey at Oxford. Accompanied the latter during his visit to America in 1941 to stimulate interest in and production of penicillin. Worked for six months in 1942 as consultant to an American firm starting the manufacture of penicillin. Since summer 1942 has been working at Oxford on penicillin and other antibiotics.

G. C. MILNER, M.A., M.B., B.Chir.(Cantab.), M.R.C.S., L.R.C.P.—Born 1902 in Salford. Educated at Cambridge and London Hospital. After about four years Hospital Appointments squatted in a new housing area, where he has remained in single-handed private practice, with the exception of two-and-a-half-years in the R.N.V.R., from Jan. 1942. On staff of Cray Valley Hospital.

JOHN MUNRO FRASER, M.A., Hons., Glasgow, 1934.—Assistant Staff Manager, Lewis's Ltd., prior to joining staff of National Institute of Industrial Psychology. Mobilised on outbreak of war and is at present a Major.

INFANT MORTALITY

By C. Paget Lapage, M.D., F.R.C.P.
Reader in Diseases of Children, Manchester University

Introductory

Infant Mortality lists are based on the rate per thousand and include deaths at the age of one year. In 1940, the rate was over 55 and in England and Wales some 33,000 babies died. Prematurity heads the list of causes, with lung diseases, congenital deformities and diarrhoeal disease next in order of frequency; but injuries at birth and generalised infections are often fatal. Epidemics like whooping cough and measles do not cause a high number of deaths, though babies are not immune. In considering the causes in greater detail, we shall see that most of them can be dealt with to some extent at least.

Causes Acting Before Birth

Rapid destruction of the infant's blood in utero and after birth by hereditary haemolytic disease causes jaundice and the infant is often born dead or dies early. Such cases may be saved by specialised transfusion.

Congenital deformities, especially those of the head and spine, are often fatal. Some are hereditary, some are due to abnormalities in utero and some possibly to special nutritional disturbances in the mother. (Ref., 1944—Warkany, *J. of Pedatrics*, 25: 6: 476.)

Faults in body fluids of the mother, as in eclampsia or diabetes, may cause congenital debility, but this does not necessarily apply to chronic starvation during pregnancy, for it seems to be a law of nature in such case that the mother suffers to the advantage of the baby.

Virus diseases may cause arrested brain development and congenital syphilis still-birth or early death.

Uterine haemorrhage in the mother before the birth of the infant is common cause of prematurity; chronic infections, like septic teeth, are toxic.

Injuries at Birth

Damage to the brain, due to the need for force in the cases of difficult labour, should be, and often is, avoided if antenatal supervision indicates earlier termination of pregnancy or Caesarean section. Cerebral haemorrhage is not always due to force; it has been known to occur in babies born by Caesarean section with few, if any, labour pains, and certainly without the use of forceps. This is more likely to occur when there is a deficiency of vitamin K and the mother's and the child's blood deficiency can easily be

remedied. Similarly, haemorrhage from the bowel can be cured if prompt action is taken to inject blood and vitamin K.

Premature babies (under 5½ lbs.) must be put at once into a warm nest of blankets with hot water bottles. They can only continue to live by generating their own heat from the food which they digest. Breast milk is by far the best food for them and District Breast Milk Banks should be established. Essentially they need care and coaxing into life. For home treatment, a "flying squad" can bring immediate help and appliances for the doctor or maternity nurse in attendance, such as electric blankets, oxygen and special clothing. The mother should receive instruction and regular visits from specially trained maternity nurses.

Premature babies under 4½ lbs. in weight are best taken to an institution in an ambulance fitted with special warmth and oxygen apparatus. There they should go into special wards with air-conditioning and the right humidity. A dry atmosphere increases their liability to infections. Many premature babies become normal though some are backward and spastic.

Asphyxia at birth needs immediate attention and usually there is no time to summon skilled medical attention or to send for special appliances. Maternity nurses should therefore carry these and be ready to aspirate the back of the nose and throat at once, sometimes even before labour is completed. White asphyxia is a collapsed state for which much can only be done by special resuscitation and anti-shock measures.

Post-Natal Causes and Infections

Post-mortem examinations show that the new-born are so liable to generalised infections that even after the first few days abscesses and disease areas are found in areas like the mastoid and in organs far removed from the source of infection. Fortunately the new sulphonamides and penicillin enable us to fight these infections, but death often follows. The most scrupulous personal cleanliness is essential on the part of every nurse and attendant, especially in relation to hands and finger-nails and after touching napkins or dressings. Clothing should not be rough and utensils, ointments, oils, etc., must be sterile. Strict isolation of infected cases is essential.

Digestive upsets are common even when breast feeding is carried out and one is not surprised by their prevalence when one considers the difficulties that have to be surmounted by inexperienced mothers. Advice is supplied by the Welfare Centres and Maternity Homes, if they are available, but too often the mother relies upon, or is swayed by, the advice of others who base their ideas on hearsay or a limited experience.

Feeding disturbances leave the infant open to infections of the bowel which are often fatal and very liable to spread to others. In hot summer weather such infections may become epidemic. Fortunately improved

hygiene and better methods in infant feeding have done much to prevent this.

Septic throats and infective colds in attendants become acute bronchitis and broncho-pneumonia in the new-born. The first fogs of the year often bring a crop of these cases and death is not uncommon. Infections from these sources may also affect the bowel. Lung tuberculosis in parents or nurse is a great danger to a new-born baby and congenital syphilis must not be overlooked.

Air and light are major factors in preventing infections. Babies put out early into fresh air sleep and eat better and are much more resistant. A good start in life is of great importance. Space and open-air conditions without draughts make nursery and ward infections much less likely. On no account should babies be allowed to be in crowded conditions or handicapped by shortage of staff.

General Considerations

Mothers, provided they are not over-worked, thrive on babylore and babyhood and babies thrive on mothering. Many of them are individualistic in their needs. Masks, gowns and cubicles, and the need for isolation, often make the baby lonely. A maternity nurse attending a baby in a private house talks to it, takes it out and trains it in good habits, and adjusts her methods to the individual baby. Home conditions are, therefore, often the best for babies. It is true that mothers need rest for the first few days after their confinement, but it is a mistake to separate them too much from their babies. When mothers go home they should not be too suddenly thrown onto their own resources. Some follow-up arrangement should always be in operation, medical if necessary, and nursing and instructional. It must be remembered that the mother may not be able to come to the Welfare Centre.

Diet

Expectant and nursing mothers need body builders, i.e., flesh foods, cheese, peas and beans, as well as fuel foods (sugars, bread, starch and potatoes), and also storage foods (fats). They need also protective foods (milk, meat, cheese, eggs, vegetables and salads). These should not be over-cooked as vitamins are destroyed by heat. They should also be as fresh as possible. We have still much to learn about the effect of prolonged deficiencies in diet on maternal health, correct reproduction and foetal health, especially in relation to vitamins and protective factors. Heating and freezing tend to deaden foods and refrigerators may come to be used mistakenly with the idea that they are refreshing and not merely preserving agents. Deadening spoils foods like milk and meat. Salads and greens may have been picked long before they are sold to the consumer. Mothers often

spend badly and come to rely on tinned foods. Their diet before and during pregnancy is therefore deficient in quality if not in quantity. Conversely, some mothers may, because they are carried away by the desire for an especially strong baby, tend to overload their system with rich, fatty, highly concentrated foods, and suffer from indigestion and mal-absorption.

Maternal Health

In hospital work one is struck over and over again by the aged appearance of many of the women in industrial areas. They often look ten or fifteen years older than they are. This is partly due to deficiencies in diet, partly to lack of air and housing space and partly to insufficient sleep and leisure. This last often means that their minor ailments, such as septic teeth, nasal sepsis and sinusitis, chronic ear diseases, indigestion, constipation and gynaecological disorders, are left to run their course without medical attention. The remedy lies in the establishment of periodical medical inspection; actually this should be customary and normal for everyone, but young married women need it more frequently and all of them should visit antenatal clinics, and the examination at these clinics should be thorough and systematic.

Social Conditions

Crowded conditions, airlessness and artificial life, and, above all, employment of women until late in pregnancy, are foreign to motherhood. They increase the incidence of immaturity and give additional opportunities for bad hygiene and infection. Rural districts tend to have a lower infantile mortality rate than do urban.

We need to preserve home life, and we, as a community, cannot afford to neglect infant and foetal life. The blame should not be put upon those parents who have had no opportunity to learn or are suffering from mental and physical ill-health brought about by overwhelming conditions of life in congested areas. The remedy is to abolish such conditions and to stimulate interest and practical effort.

If we are to preserve home life, something will have to be done for motherhood. Every expectant or nursing mother should have enough food of the right kind and should have facilities to cook it. She should also have a home that gives her proper opportunties for her daily duties of preparing food, working, resting, sleeping and for recreation. At present too much depends on the mother; she has to look after the house, do the cooking and washing, attend to the children and get them off to school, and also look after her husband. It is extraordinary how the working-class mother does manage to get through all the things she has to do. She can hardly be expected, in addition, to attend lectures and demonstrations. Also she has no leisure to keep up her intellectual standards. Restaurants and day

nurseries could do much, but some form of domestic help must be provided. There must be more maternity nurses with fewer cases on their hands and they must attend for a longer period.

Better housing, as is seen in some of our model housing estates, which have been built to replace slums, with suitable kitchens and living rooms, with air and space and some protection from noise, is essential, and not only leads to improved health of all concerned, but also brings the knowledge which will make mothers unwilling to go back to slum life.

Relief Measures

It is very important to enlarge and extend our maternity accomodation which is at the moment quite inadequate. Maternity nurseries, whether at homes or in an institution, must have a high place in maternity work and should never be overcrowded. There is always the danger of this because urgent maternity cases often have to be accepted at once, but this urgency relief should never crowd the nurseries or overwhelm their staff. Without also having means of expansion the nursery may come to be a bottle-neck. Periodic and efficient inspection of all maternity institutions and homes and their nursery accommodation should be carried out by experienced paediatricians. Day nurseries need similar supervision.

Education and Research

Education is a leaven which spreads and multiplies itself a hundred and a thousandfold and has many and varied repercussions.

Demands for better housing, better food, more room and especially more time to attend to the baby, for leisure and study periods, for films and books on baby care and finally for increased maternity services should come from all sections of the community.

Pre-maternity education of girls is useful as a preliminary. But even pregnancy is not always enough to stimulate the expectant mother's interest and during the later stages she may be better left alone. Only the presence of the baby will make her realise what she ought to know and has to do. Mothers learn rapidly when they come together and talk about such subjects as clothing, bathing, airings, and above all, breast feeding. Baby care and baby lore can and should be interesting and exciting and even fathers can be a great help and should have instruction. Discussion groups should be under expert guidance in the nurseries of maternity institutions.

Good teachers, and plenty of them, should work in nurseries and welfare centres and be able to give individual help at home. The importance of bridging the gap between discharge from a nursery or hospital to home management is again emphasised. Some follow-up arrangement is essential even when babies are going to a distance or are in rural areas.

A maternity nurse needs a thorough grounding in a well-equipped school

because she is often far from medical help and much may depend on her knowledge and skill and prompt action. She also needs regular refresher courses.

For such training, Sister Tutors are needed and their training too should be thorough if possible in both nursing and maternity experience. Some Universities are starting courses for them.

There will be a shortage of both practitioners and teachers in paediatrics in the next ten years, and courses for training both of them should be instituted at once. Welfare Centres, Maternity nurseries, and Day nurseries need staffing and inspection. It is no good having schemes to reduce the infantile mortality rate without the personnel to carry them out.

Research has been neglected in the past. Many subjects in relation to infantile mortality suggest themselves at once: vitamin K deficiency, cerebral haemorrhage, the causes of prematurity and debility and the pre-eclamptic state. Those working in infant welfare centres and ante-natal clinics should be stimulated by grants and scholarships and those who hold the purse strings can realise that money spent in these ways is money well spent, for it provides for the health of future generations.

Motherhood and baby care should be placed in the forefront of our national effort.

SUBSCRIPTIONS

Subscribers are reminded that the present issue completes Volume III of the HEALTH EDUCATION JOURNAL and that subscriptions to Volume IV which commences with the January 1946 number are now due. A subscription and banker's order form will be found in the present issue.

BINDING

Arrangements can also be made for binding Volume III at an inclusive cost of 5s. 6d. Copies of the Journal for binding should be sent to the Editor, HEALTH EDUCATION JOURNAL, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1., with a cheque or postal order for that amount.

Readers who have kept Volumes I and II and now wish to have them bound may send them for binding at the same time.

MODERN TENDENCIES IN EUGENICS

By Eliot Slater, M.A., M.D., F.R.C.P., *Assistant Medical Officer, Maudsley Hospital*

The word 'eugenics' was coined by Sir Francis Galton; he was also the pioneer of the science of human genetics, with his studies of the similarities of twins, and of the way in which talent and genius tend to run in families. Galton was himself a kinsman and friend of Charles Darwin, and one of the first to see the great implications of Darwin's theories for the human race. Darwin's theories met with a great deal of hostility on theological grounds. It was believed that they were incompatible with the dignity of humanity or with man's sonship to God. Most of us now think that these objections were mistaken; but many still believe that qualities such as altruism, which seem to belong to the soul, cannot possibly be determined by heredity. It seems likely that this view too will pass, and that we shall come to accept the idea that heredity lays down potentialities, which can be developed well or ill by our upbringing and education, and by the life we lead.

'Eugenics' means etymologically 'breeding well'; and what is understood under eugenics at any time will depend on the extent of scientific knowledge of the nature and mode of inheritance of human qualities, and by religious and philosophical ideas of what we should mean by 'well.' So eugenics combines an objective science on one side with conceptions of worth and value on the other. Our scientific knowledge has increased, and our notions of value have changed very considerably, since Galton first set the movement going. When it came to be recognised that many forms of blindness, of physical deformity and imbecility and idiocy depended on inborn tendencies which were inherited from parent to child, the demand was made that persons suffering from these defects should be discouraged from having children. The Eugenics Society sponsored a private bill for offering these people the chance of having themselves sterilised, if they so wished. The bill was never passed, but it now seems likely that if a man wished to be sterilised on these grounds, and was sterilised, neither he nor his surgeon would get into serious trouble.

The discouragement of breeding among people who cannot be expected to have the normal chance of healthy children is often called 'negative eugenics.' It is contrasted with 'positive eugenics,' by which parents who could be expected to have children superior to the average would receive especial encouragement. Negative eugenics was taken to its logical limit, and a good bit beyond, in Nazi Germany. There it was not left to the initia-

tive of the individual to have himself sterilised, if he suffered from a transmissible defect. It was enforced on him, if he had had an attack of one or other of the commoner forms of insanity, or if he suffered from chronic and severe alcoholism, from hereditary physical defect, or from more than a mild degree of mental deficiency. He could only escape this by remaining in hospital until after the end of the reproductive period of life. The Nazis also encouraged the healthy population, if not Jewish, to have a larger number of children. This was done by a very intensive propaganda, by giving state loans to the newly married which could be paid off by having children, and by special concessions to the prolific in salary scales, taxation allowances, rationing, and in other ways. They did indeed see quite a big rise in the birth rate, which continued until an advanced stage in the war.

However scientists, such as Haldane and Dahlberg, were not slow to point out that repressive measures against the breeding of the unhealthy would have only a small practical effect. The great majority of mentally defective children do not have defective parents, but parents that are only slightly on the subnormal side of average. Most of the insane have mentally normal parents, and most of the children of the insane have been born before the onset of the mental illness. The Nazis were in too much of a hurry. There isn't any millennium just round the corner, which we can reach by stock-yard methods. We need to know a great deal more about human heredity than we yet do to lay down any absolute rules; and what we should try to do is to make sure that we are eugenically on more or less the right road, and try to keep along it. At the moment we are probably on the wrong road.

One of the things that the Nazis did not take into account is that it isn't even certain that it would be desirable to eliminate altogether all tendencies to defects of various kinds. In genetics a good deal of attention has been paid of late to the hereditary make-up of various species of animals in the wild state. It has been found that they too are almost as subject as mankind to the sporadic appearance of abnormalities, slight and severe. And yet the population as a whole remains healthy. We believe now that these minor abnormalities are often only unhealthy and dangerous in certain circumstances, and if the environment were to change they might become advantageous. The fair-skinned man is at a disadvantage in the tropics, but seems better adapted than the negro to cold climates. A genetic factor is likely to have a number of effects, some of which may be disadvantageous; but if the environment changes to one in which some of its effects are beneficial, then natural selection will favour its spread through the population, and will encourage the spread of other hereditary factors which enhance its good and diminish its ill effects. The variability of a species, which shows itself among other ways in the occasional appearance of abnormalities, is of great survival value; once a species becomes too stereotyped it is faced with extinction. On

the other hand, of course, it is equally undesirable for these abnormalities to become too common. They should be discouraged from spreading, but not ruthlessly extinguished.

It seems probable that most of the qualities which are of the greatest interest to all of us, such as good health, intelligence and a happy disposition, have a basis in heredity. We can be lucky or unlucky in our parentage just as much as in our upbringing and our educational opportunities. The hereditary basis for these qualities does not lie in a single hereditary factor, but in very many. It is rather like being dealt a bridge hand of thirteen playing cards. Most people have very average hands, without an excessive proportion of either high or low cards, and fairly evenly distributed between the suits. If we are considering intelligence, we might say that the simpleton is dealt a 'Yarborough'; 'all-rounders' get hands with high cards in a number of suits; geniuses get very unusual hands in which there is both length and strength in one of more suits. The hand that is dealt to a man is taken from the hands that have been dealt to his father and mother. If neither of them had more than a single honour, it will only be a rare chance that will give the child a game hand. So the hands that will be dealt out to the next generation depend on the cards already in circulation. If many people with a good share of aces and kings do not distribute them before they go, the next generation will be the poorer.

In a barbaric state of society this does not happen. The mentally defective, the unhealthy, the unhappy and ill-adapted tend to produce fewer children than their more fortunate brethren, and to look after them less well, so that fewer survive. In a civilised society with social agencies to protect the least fortunate children, the mentally and bodily enfeebled may outbreed the others. It is such an obviously sensible thing to limit the number of one's children, that the sensible and the prudent may cease to produce their fair share of children, while the imprudent produce as many as ever. Fraser Roberts has shown that this is probably happening at the present time. He found that in a very large group of school children, the unintelligent children came from larger families of brothers and sisters than the intelligent. This was as much true among the poorer families as among the better off. He tells me that the effect is so big that if it were allowed to continue, the average ranking in intelligence quotient would probably be three points lower in one generation than it had been in the previous one. If this is really happening, and other authorities are agreed that it is happening to some extent, it is disastrous. In the difficult years that lie ahead we shall need all the intelligence we can muster to deal with the problems raised by our increasingly complex civilisation. Good feeding and upbringing, good education, and making the very best of all our talented children from whatever class, could be great forces for good; but they could not compensate for a consistent deterioration of innate endowment.

To solve social problems we do not need only great leaders and statesmen; we also need an intelligent and informed public. If we could transform the three points downwards into three points upwards, it would become more likely that sensible solutions of complex problems would be generally understood and generally accepted. Galton himself pointed out the immense social importance of a high average of intelligence in the public. He argued also that a raised average intelligence would make geniuses more frequent. We can put this into rough numerical terms, and calculate that, human variation in innate ability being what it is, the one-in-a-million genius would be just ten times as common if the average intelligence of the population were another eight points higher on the Binet scale. This point would be reached in three generations, if we reversed the present trend. To make ten geniuses grow where one grew before would be an immense contribution to human health and happiness. Though few of us, geniuses included, can expect to have a genius among our children, we can buy as many shares as we like in the lottery. The majority of geniuses, like the majority of idiots, come from parents who are more nearly average. To assist in producing a new generation of healthy and intelligent men and women is a task which lies in the path of duty of all of us, those of average ability as much as the rest. Early on in the history of eugenics too much importance was laid on the progeny of extreme variants. We now know, as we might in our democratic society be glad to know, that the eugenic welfare of the race is affected by the lives of every one of us.

HEALTH EDUCATION MATERIAL

The Central Council has a comprehensive selection of posters, pamphlets and films for use in health education. These cover a wide field, ranging from diseases such as diphtheria, measles, whooping cough, infantile paralysis, tuberculosis, influenza and the venereal diseases to the importance of cleanliness, sleep and feeding and the problems of health education in general and sex education in particular. Some are designed for distribution to general public; others for special groups such as children, adolescents and young adults, teachers, youth leaders, parents, nurses, factory workers and so on.

A particularly attractive series of leaflets, illustrated in colour by Fougasse, is in active preparation. Those dealing with feeding of toddlers, communicable diseases, coughing and sneezing, and the head and body lice are already available; while others on the care of the feet, clothing, nutrition, nervous difficulties, indigestion and rest and relaxation should be ready shortly.

Details may be obtained on application to the Medical Adviser and Secretary, Central Council for Health Education.

PARENTS UNWILLINGLY TO SCHOOL

By Mrs. G. M. Goldsworthy, *Organiser of Evacuated Nursery Schools, L.C.C.*

It is often said against nursery schools, both by the uninformed and by those jealous for the preservation of children's home ties, that they take away responsibility from the parents. Thus, there appeared on the notice-board of a suburban church, recently, a rhyme entitled "A Modern Child's Prayer:"

> "God bless the clean clinic which weighs me with care
> And the nursery school teacher who tooth-combs my hair
> And all the youth leaders so toil-worn for me
> And God bless my Mother, who never sees me."

Perhaps the Vicar who exhibited this may be said to be in both the "uninformed" and "jealous" categories, for I discovered that there is no nursery school in his parish.

There are probably some nursery schools whose staffs are so zealous for the children that they carry a large part of parents' responsibility, but I consider that a good nursery school, under the leadership of the right type of head—a suitably trained teacher of vision and wide experience—should set out to win the co-operation of parents and to make them fully aware of all their responsibilities.

Keeping in Touch

During the war, the parents of evacuated London nursery schools have been in touch with parents only through correspondence and on visiting days: circumstances have made it almost impossible to obtain complete parent-teacher co-operation. Many of the teachers in charge of these evacuated parties have done a great deal to maintain the parents' interest in their children's development by writing long interesting letters in place of the "field card" type of message often sent when, for any reason, parents and children are parted. Many mothers who parted with children of two years, for example, expected to find them, a year later, still coping with the difficulties of babyhood: they were not prepared to find that their two-year-olds had developed into sturdy children of three, full of initiative and self-reliance, able to stand alone and deal with day to day problems without any undue amount of help from adults. This same mistake—or perhaps, an impulse to keep their children babies as long as possible—was seen when parents sent for their children's use clothes of a size they wore when they

left home. Periodically, therefore, the staffs of various schools took snapshots of the children who were rarely visited—because of the demands of war-work, the expense of travel and, in some cases, indifference—to remind parents that their children were growing up. Similarly, the Superintendent of one evacuated school, distressed when a child failed to recognise his parents, asked all the parents to send photographs of themselves and other members of the families, and the photographs were then hung near the children's beds. In this way children were given pleasure (and a harmless pride of possession) and the task of keeping alive in their memories all the details of home life was made much easier for the staff and was more successful. I once saw a father look desperately unhappy and dejected when he visited his three-year-old son, evacuated to a house some distance from London, and found that he was no longer recognised. He bent forward and said, "Come along, Tom; give us a smile: I've paid a quid to come and see you smile!" I resolved to do all that I could to ensure that such a scene should never be repeated in my party.

Parent-Teacher Co-operation

In peacetime, without exception, the only really successful day nursery schools were those which encouraged the most complete co-operation between parents and teachers. The first means employed by every good Superintendent was the daily meeting and frequent discussions with parents when they brought the children to school. The school nurse joined in these talks, and in this way parents and teachers had ample opportunity of discussing problems concerning the children's mental and physical health. For instance, a child newly enrolled in the school may have consistently refused to eat the first course of the well balanced midday meal but quickly finished his helping—and demanded more—of the sweet course. A chat with the mother perhaps revealed her ignorance of food values and a habit of providing bread and jam or sweet puddings as a midday meal. With this knowledge, the wise teacher adapted her treatment of the child and in time, without using force or persuasion, the child gradually adjusted himself to a normal diet. At the same time, efforts were made to win the mother's co-operation in providing similar meals at the week-ends. Again, perhaps a child would not eat at school because at home he was forced to do so by an over-anxious mother who possibly used force or an emotional appeal. Knowing this, the nursery school teacher arranged for the child to receive very small portions and feigned complete indifference to his reception of the meal, thus gradually achieving the desired result in fostering in the child a healthy interest in the food which was served to him. Here again the teacher prevailed upon the mother to use the same tactics, after explaining why they were used, and eventually the relation of parent and child at meal times became normal. By similar means, when nurse and teachers suspected

or discovered that children had insufficient or unhealthy sleep at home, that they were wrongly clothed or that they wore ill-fitting shoes, parents were shewn what was best for the children and how to make any necessary changes. In nursery schools situated in the poorer districts of large towns, it was often customary to bath the children when they arrived at the school. In the best of these schools, the Superintendent arranged for the mothers to bath their own children, when necessary, before they left the school. In my own school, there was also a rota made for mothers who lacked the necessary conveniences at home to use the school bath themselves after school hours.

Mental Health Education

In the province of mental health, the teacher's influence with all parents can be far reaching, but the best results can be obtained only if parents can be shewn by demonstration how best to understand the child, to know his needs at each successive stage in his development and the most satisfactory way of satisfying those needs. So, at all good nursery schools, parents were encouraged to visit the school as often as possible and to spend some time unobtrusively watching their children. They saw their children's reactions to other children in the group, the teacher's methods of directing energies into the right channels, the opportunities given to win a sense of achievement and the way in which discouragement and resentfulness were avoided by the giving of tactful, timely help. Parents saw bullying tendencies diverted so as to produce, later, a sense of leadership or a timid self-conscious child gradually becoming an interested member of a group of children, excitedly exploring the possibilities of carefully chosen play material or joining in group activity planned to develop poise and control. In no good nursery school is there to be seen the notice still displayed in some few old-fashioned elementary schools—"No parents beyond this door." Instead, the parents are encouraged to sit in the playrooms, to see for themselves the careful guidance of their children's development. Particularly is this freedom for parents necessary when children first join the school, so that instead of tearful—sometimes hysterical—partings in the cloakroom children are gently encouraged to join a group while mothers sit watching them, remaining a little less time each day until the children are happy and secure in their new environment. In dealing with younger children, consistent treatment is essential, and at the school many parents resolved to set at home the standards which they saw accepted happily by their children. So, the teachers' efforts to make children self-reliant were supported by the parents' avoidance of too much petting and waiting-upon at home, and children who were accepted at school entirely on their own merits were no longer ignored at home as "only babies" and given no help to develop and use their initiative.

Sex Education

Co-operation in everything concerning the children is beneficial, but there are certain matters in which co-operation is *essential.* One of these is the important and difficult question of sex education. It is a most important question, because its correct handling in early years can influence for life children's attitudes to sex. For most young children, the question, "Where do babies come from?" is entirely a simple demand for information; it cannot, in very young children, be prompted by anything else. This truth is perfectly shown in the true story of a little boy who asked this question of his teacher. When he had been answered quite frankly, he said, "Oh, I see . . . and there's something else I want to know; why do some people cut the top off a boiled egg? My mummy always smashes ours with a spoon." It was obvious from the child's second question that he wanted only to add some knowledge of babies to his growing store of general knowledge, for it had for him no greater importance than the correct way in which to deal with a boiled egg!

Contrast with this the case of two children whose questions at home had always been frankly answered by their mother. They went in time to an old-fashioned kindergarten and one day came home with this surprising news: "Now that we're growing up, Mummy, we've heard the *real* truth, at school. *Now* we know that the stork brought us to you!"

That the frank attitude to sex education, which all thoughtful parents and teachers are now striving to cultivate, is the only healthy one can also be shown by example. An older child asked her mother how long she had taken to grow before she was born. When she was told, she exclaimed, delightedly, "But, Mummy, how perfectly lovely! For nine whole months I went with you everywhere!"

Parents' Clubs

I would like to see, therefore, teachers and parents—fathers and mothers alike—take pains to know each other well. Let the parents visit the school (whether it is a nursery school in some squalid back street of an industrial town, or a public school, or even an exclusive finishing school) not only on special occasions and open days, but when the children are at work. Shakespeare wrote of the schoolboy of his day "crawling like snail unwillingly to school": nowadays, this is true of few children, but it is regrettably true of most parents. If nothing more is learned at these visits, it will be a useful step forward for every parent to know that the good teacher is not interested only in imparting some knowledge of a set range of subjects. If she has her heart in her work, the teacher is the complement of the parents and, unlike the average modern parent, *she* has had experience of numbers of children. She has a knowledge of children in general, for every child she has known has taught her something of all children.

My work has been always among young children, chiefly in nursery schools, but I feel sure that *all* schools would benefit from the activity of such a parents' club as many nursery schools had before the war. That at my own school met periodically in the school building and alternated very pleasant social evenings with lectures and discussions on subjects of general interest to parents. The subjects varied—sometimes we discussed family relationships or adult relationships, sometimes teaching methods, sometimes diet and food values, and so on. The subjects were chosen by the parents; my part was only to find a specialist in the chosen subject to talk to us. The discussions which followed these lectures often taught us as much as did the lectures themselves. Almost always some of the parents stayed to discuss their own difficulties and ideas, sometimes with the staff, and sometimes with each other. Quite unexpectedly, this club came to play a part in widening and strengthening the social life of the district, when the parents formed their own dramatic club.

Lack of co-operation between parents and teachers does much more than deprive both of most valuable assistance in their common task—the training of the complete individual, body, mind and spirit—for non-co-operation can often lead to a dangerous rivalry between the two, and it must damage the position of both in the children's estimation when either teachers or parents criticise the other in the children's hearing.

Sometimes, parents feel that teachers' methods are wrong, sometimes teachers consider that parents undermine at home much of their most painstaking work at school. Why leave these things to be discussed at the tea-table at home, or in the staff room at school? "The world moves forward on the feet of little children": between them, parents and teachers can ensure that it moves forward in the right direction and can fit the children to take in due time their places as useful members of the community, and do all this without robbing children of the fun and laughter which is their birthright.

The November, 1944, number of the *American Journal of Public Health* (Vol. 34, No. 11) contains an interesting article by Dr. Arthur Massey, Chairman of the Central Council for Health Education, who was the guest of the American Public Health Association at fourteen state and regional meetings during May and June of last year.

Under the title "Popular Health Education," Dr. Massey outlines for American readers the organisation of health education in Britain, paying special attention to the work of the Central Council for Health Education. He discusses the role of poster, article, press advertisement, radio, film and lecture in health education, and concludes with an interesting account of a health "brains trust" at a large engineering works.

REVIEWS

HOME LIFE AND THE COMMUNITY, by Leslie George Housden, M.D. (National Association of Maternity and Child Welfare Centres for the Prevention of Infant Mortality. 1945. Pp. 66. Price 3s. 6d.)

Dr. Housden's main theme, in this lively and outspoken little book, is the primary importance of parentcraft in the solution of social problems. He is well aware of the need for better housing and economic security, but he claims that "Good parentcraft shines out brightly in the worst streets and no child should suffer from lack of it because his parents were denied instruction before he was born."

The writer who pays particular attention to one aspect of a complicated problem is always liable to the charge of over-simplification but, nevertheless, the thoughtful reader will find this book both useful and stimulating.—K. C.

NUTRITION AND NATIONAL HEALTH, by Sir Robert McCarrison. (Faber & Faber. 1943. Pp. 70, with index 5 pages, 3 pages of photographs and 4 diagrams. Price 6s.)

The theme of this book, "that perfectly constituted food is the greatest single factor . . . for . . . health" may have required proof when the author delivered his lectures in 1936 but can almost be taken for granted in 1945. His approach is unusual. He is not interested simply in vitamins, but in human health. This he shows by his stress on the effects of partial absence of all desirable food factors; his descriptions of interrelations such as the effects of alimentary health on nutrition and nutrition on alimentary health, and his experiments in feeding rats on certain racial diets. Even to-day we have no complete knowledge of the food factors essential for *human* well-being, nor of the variations caused by race or religion, and any study of these subjects, such as those described in this book, are worth study.—A. M. S.

VIRUS DISEASES, by T. M. Rivers, W. M. Stanley, L. O. Kunkel, R. E. Shope, F. L. Horsfall, P. Rous. (Oxford University Press. 1943. Pp. 170. Price 12s.)

This is a book for the expert. Virus diseases, which play such economic havoc among plants and animals, besides causing many of mankind's maladies—the common cold and influenza, measles, mumps and chicken-pox, infantile paralysis and yellow fever—have been the subject of such intensive research in recent years that no one person could hope to deal with the whole subject adequately. Consequently six workers of international repute in the virus field have joined hands to produce this series of reviews on different aspects of the problem. Thus Rivers deals with virus infections generally and more particularly with vaccinia virus; Stanley, who first showed that the virus of tobacco mosaic was a crystallisable nucleo-protein, discusses the chemical structure and mutations of plant viruses; while Kunkel shows that a fruitful method of learning more about plant viruses is to find new hosts for them. Shope tells the fascinating story of swine influenza, with the lungworm and earthworm playing their essential parts as intermediate hosts; Horsfall brings up to date the great volume of recent researches on human influenza, with particular reference to prophylactic vaccination, and Peyton Rous shows the important place of viruses in the genesis of tumours.—R. C.

THE FAMILY WOMAN AND THE FEMINIST, by Dorothy Paterson. (Heinemann. 1945. Pp. 50. Price 2s. 6d.)

This book is designed to support the views that the sexes are comple-

mentary and that motherhood provides the most vital career for the majority of women.

These claims are more generally accepted than the writer suggests, but her sentimental approach and tilting at non-existent windmills will do little to gain further support for them.—K. C.

POPULATION FACTS AND POLICIES, by Eva M. Hubback. (Allen & Unwin. 1945. Pp. 47. Price 2s. 6d.)

Mrs. Hubback has provided an admirable survey of the main facts relating to the declining birth-rate in this country and has outlined certain policies to modify the trend. The subject on which a Royal Commission is now sitting is essentially one that concerns young people and *Population Facts* should be widely used as a basis for study circles and discussions.—V. D. S.

SHORT NOTICES

THE SOCIAL BACKGROUND OF THE VENEREAL DISEASES. (Cail & Son, Ltd., Newcastle-on-Tyne. 1944. Pp. 20.)

A report on an experiment in contact treating and an investigation into social conditions, carried out for the Joint Committee of the Tyneside Counties and County Boroughs.

PSYCHO-PATHOLOGY OF PROSTITUTION, by Edward Glover, M.D. (Institute for the Scientific Treatment of Delinquency, 17, Manchester Street, W.1. Pp. 16. Price 1s.)

A report of a lecture delivered at a meeting of the International Bureau for the Suppression of Traffic in Women and Children.

SUGGESTIONS AND SCHEMES FOR WORK IN SOCIAL BIOLOGY, by R. Weatherall, B.A. (Nottinghamshire County Council Education Committee. Pp. 16.)

An interesting set of suggestions for work in Junior, Modern and Grammar Schools. Will be of value to many teachers.

FILMS IN PRODUCTION

Readers will probably be interested to know the present position of health films under production or consideration by the Ministry of Information for the Ministry of Health and the Central Council for Health Education.

Three films on the care of the eyes, teeth and ears are well under way and should be available for distribution by the time this appears. They are entitled respectively *Your Children's Eyes*, *Your Children's Teeth*, and *Your Children's Ears*, and are sound films which will be available on loan from the Central Council for Health Education free of charge in 35 and 16 mm.

A cartoon film *Old Wives' Tales* is still in the scripting stage, but should prove very useful when completed.

Another film in the scripting stage is *Parents and Children*, which is to deal with the growth of the young child as a whole and how parents can best encourage healthy development.

Future plans include *How to Tell* (a film on answering childrens questions about sex), *Your Children's Meals* and possibly *Your Children's Sleep*.

When these films are available, fuller details will be given in this Journal.